



Commentary

Valent Representation: Problems and Prospects

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Hatzimoysis, Anthony. 2024. "Valent Representation: Problems and Prospects."
Journal of Philosophy of Emotion 5, no. 2: 17-23. <https://doi.org/10.33497/2024.winter.2>.

Abstract: If emotion is not an arbitrary compilation of fixed types of (descriptive, conceptual, conative, prescriptive) content, nor a state that can be reduced to other types of pre-existing (perceptual, cognitive, behavioral) states, then what sort of thing is it really? Tom Cochrane has proposed that emotions are valent representations of situated concerns. Valent representation is a type of mental content whose function is to detect the presence or absence of certain conditions; what makes that type of content valent is that without needing the mediation of any other state, a response is triggered that is disposed to increase or decrease the presence of the condition represented. I raise doubts about the plausibility of that account in light of recent work in philosophy of biology and philosophy of mind.

Keywords: emotion, representation, pushmi-pullyu representation, mental content, teleosemantics, Ruth Garrett Millikan

The Emotional Mind (Cochrane 2018) is a book that moves against the current of contemporary philosophy of emotion. Methodologically, it is now commonplace to focus on the often turbulent surface of an emotional phenomenon, to then distinguish between its several dimensions, and subsequently to identify its characteristic marks, so as to eventually bring some theoretical order, which will facilitate the discovery of the emotion's conceptual core. That method fits well with the prevalent approach to mind as a varied terrain, divided into several districts, one of which happens to be occupied by certain states grouped under the heading of "emotion."

It seems to me that Tom Cochrane begs to differ on both counts. On the one hand, his method is not analytic but synthetic: instead of taking as given a fully formed emotional phenomenon, he begins from the most basic elements of mental life, gradually building his way from the ground upwards. On the other hand, he treats emotion not as an add-on item of the mental landscape, not even as a discrete section of the psychological field, but as a central feature of our interaction with reality. In that sense, the title of the book is so literal that it might sound misleading: one may have to reach the end of the book in order to realize that the title does not imply that next to, for instance, a "cognitive," "volitional," or "conscious mind" there is also an "emotional mind"; instead, if the author is right, the human mind as such is, in a certain sense, emotional.

Both the method and the substance of those claims deserve extended discussion. Here, I would like to concentrate on a core claim of the book, that “emotions are valent representations of situated concerns” (10). Although it is put forward merely as a “slogan,” it appears to me that the phrase captures accurately the importance the author places upon the idea that emotions should be viewed as an elaborate exemplification of a foundational item of our mental life—foundational, I would say, both diachronically (it seems to be more primitive than other types of mental content, hence it might reasonably be assumed to have arisen at an earlier stage of our evolutionary history), and synchronically (as it might constitute the ground level upon which more elaborate forms of representation are constructed).

Valent representation is briefly defined as a type of mental content whose function is to detect the presence or absence of certain conditions. What makes that type of content “valent” is that “without needing the mediation of any other representational state, a response is triggered that is disposed to either increase or decrease the presence of the condition being represented” (1-2). The lack of a mediating state between the descriptive content and the directive content is crucial, as it holds the promise that the notion of valent representation “can also apply to mental states that are wrapped up with automatic bodily responses, such as emotions” (34).

Although the end point of the discussion is to make sense of emotional phenomena, the reader might feel puzzled by the intricate details of the debates introduced, reconstructed, and resolved in chapter one, which, if I am not mistaken, is a text that includes no reference to the standard literature in philosophy of emotion. As Cochrane’s argumentation unfolds the discussion becomes more ambitious, aiming at nothing short of establishing “a fundamental type of representational content” (9) that pervades, in various forms, our mental economy. Why is the author taking up such a tall philosophical order? Because, I assume, he rightly wants to come clean on an issue that many other theorists of emotion find more convenient to leave unresolved: if emotion is neither an arbitrary compilation of fixed types of (descriptive, conceptual, conative, prescriptive, etc.) content, nor is it a state that can be easily reduced to other types of pre-existing (perceptual, cognitive, behavioral, etc.) states, then what sort of thing is it really?

Cochrane rightly notes that “in emotions, three of the major strands of mind–representation, agency and value—are tightly intertwined” (9). Hence, if emotion is to count as genuinely important and distinct, it must be a state in which those three dimensions are seamlessly integrated. And that state is precisely what “valent representation” is supposed to be.

There is an explanatory problem here, to wit, that valent representation sounds like a perfect fit, indeed, a fit too good to be true. We were looking for something that somehow finely combines certain characteristics, and presto, here is a state, with a new name, which has all the desired characteristics as part of its definition! To avoid that problem—to prove that valent representation is something more than a convenient philosophical fiction—it is important to show that belief in its existence is independently motivated, i.e., that we have reasons to assert that this type of representation does real work, independently of its usefulness as a model for emotions; and the proper way to achieve that goal is the hard way, for which Cochrane opts in chapter one of his book.

His approach draws on Fred Dretske’s causal theory of content, Ruth Garrett Millikan’s consumerist theory of mental content, and Frank Ramsey’s success semantics. A common claim in those different theories is that to understand representation we need to look at what it does, or rather, at what its presence may help its possessor achieve, *vis a vis* the conditions in which it lives and the problems it encounters. Having a representation is primarily a matter of “responding in a sensitive way to objects. . . . Interaction entails that the creature has in some vital respect become attuned to the presence of that object” (15). That claim, in its turn, raises the issue of what exactly counts as an “interaction.”

The standard way of tying possession of mental content with the performance of an act is the Humean theory of motivation, according to which, when a state with one direction of fit (call it “reason” or “belief”) gets intimate with a state with the opposite direction of fit (call it “passion” or “desire”), an action becomes their offspring. Let us think of the content enjoyed by the former kind of states as “descriptive,” and the content possessed by the latter kind of states as “directive.” Let us further assume that descriptive content is amenable to a naturalistic account that invokes some sort of causal impact between the agent and their environment; it is not equally easy to assume that the same applies to directive content. The problem here is twofold: on the one hand, it is not clear how the relevant state of desire can get started; and on the other, it is not obvious how that state may end. How can something not yet existent, such as a future aim or goal, causally impact an agent, thus leading to the arising of the agent’s specific desire? And how does, once she gets started acting on that desire, the agent manage to stop?

It appears, therefore, that the standard way of thinking about interaction with the environment, in terms of two separate and disjoint types of representation, faces some challenges. Moreover, even if those challenges were met, we would not have *ipso facto* resolved the problem of accounting specifically for emotion as a type of state in which external world awareness is wrapped up with automatic bodily responses. To make sense of emotions “what we need,” as Cochrane puts it, “are cases where the directive function is more immediately bound up with the acquaintance with an object or state of affairs” (2018, 18). Cochrane finds a model of such cases in a specific mode of interaction that is involved in a type of representation that was introduced in the literature by Ruth Garrett Millikan (1995), under the title of “pushmi-pullyu representation” (PPR, in short). PPR is a unitary state that faces two different directions, serving both a descriptive and a directive function—it thus has both truth conditions and satisfaction conditions. Millikan finds plenty of examples of PPRs in the natural world: an animal’s call to conspecifics “connects directly with action,” and as she continues to explain, “its function is to mediate the production of a certain kind of behavior such that it varies as a direct function of a certain variation in the environment” (190). Appealing to considerations of simplicity, Millikan further claims that PPRs are more primitive than either purely descriptive or purely directive representations: “The ability to store away information for which one has no immediate use (pure description), and to represent goals one does not yet know how to act on (pure direction), is surely more advanced than the ability to use simple kinds of [pushmi-pullyu] representations” (192).

Cochrane clarifies his way of appropriating Millikan’s approach with the following example: “Suppose that whenever there is food lying in front of me, I grab that food. . . . The descriptive representation of food in front of me could be wired up to directly stimulate my grabbing action. The behavioral output is reflex-like. Meanwhile, if that behavior serves to physically manipulate the object or environmental condition, it can help to fix reference. That is, the representational state is about whatever object or environmental condition the grabbing response is disposed to manipulate” (Cochrane 2018, 20). He then moves on to elaborate, qualify, and extend in useful ways the PPR-based model, bringing into the discussion novel insights about how the logic of negative and positive feedback circuits may illuminate the structure of both avoidant and attractant loops. The theoretical construction he erects in the rest of the first chapter and, subsequently, in the whole of the book is, to my mind, quite impressive. What I am not certain about is whether the appeal to PPRs can sustain such a construction.

I shall present certain considerations that tell against the explanatory power of the notion of pushmi-pullyu representations. If those considerations are valid, PPRs are not a plausible ground for building a picture of the human mind. Given that Cochrane’s view of emotions as valent representations is tied with the notion of PPRs, the problematic status of that notion and the shortcomings of its explanatory power appear to undermine the author’s project.

Discussions of PPRs in the philosophical literature tend to focus exclusively on the compatibility of that type of representation with some form or other of a naturalized theory of mental content (cf. Artiga 2014). Although Cochrane's account is set in the tradition of philosophical naturalism, I propose that we consider whether his appeal to PPRs is justifiable, irrespective of our commitment to naturalized theories of mind. What we are interested in is whether PPRs may form a plausible model for valent representations, which purport to illuminate the structure of emotional experience.

Recall that a PPR is a non-conjunctive representation with both descriptive and directive content. Its main function is to adapt behavior of an organism to environmental changes without intermediate inference. The notion of PPR is originally introduced by Millikan (1999) as exemplified primarily in primitive representational systems. However, Cochrane's (2018) elaboration on the PPR notion is perfectly in tune with Millikan's agenda, since in her seminal paper she was quick to extend the application of that notion to value-laden forms of behavior, and various patterns of human communication.

What matters first for present purposes is to check whether there are actual cases satisfying the conditions for some representation bearing both descriptive and directive content, and secondly, to consider whether such cases may include phenomena which relate closely to valent representations as the grounding element of emotional states. In addressing the former task, I shall rely heavily on my non-expert knowledge of the biological literature, which seems to suggest the following picture.

PPRs can be attributed to plants, such as the wild lima bean, which exhibits the capacity to defend itself against herbivorous assault, thanks to its leaves releasing an airborne volatile that, when received by the self-same plant's leaves or neighbors' leaves, initiates the release of sucrose on the leaf surface. That process in its turn attracts ants, which defend the leaves from intruding herbivores (Heil and Bueno 2007). The plant volatile maps onto the presence of the attacking herbivore, as well as onto the initiation of a response conducive to survival. The content of the volatile appears to be simultaneously "there is an herbivore/initiate defenses" (Bauer 2020). Given the extreme simplicity of the system, the volatile of the wild lima bean most plausibly counts as a non-inferential, non-mediated, non-conjunctive, and thus, a pushmi-pullyu representation. That phenomenon appears to fit perfectly the structure of valent representation, whose main function is to either increase or decrease the presence of the pertinent condition being represented.

PPRs appear also in operation in the case of the tellinid clam, a small burrowing bivalve whose foraging efficiency is at shallow depths in the sand, thus exposing themselves to predation, particularly from shore crabs. As soon as the clam detects the effluent from crabs feeding on their conspecifics, it burrows down to deeper depths; yet once the effluent diminishes, the clam returns to shallow depths in the sand (Griffiths and Richardson 2006; Bauer 2020). In the present case, the effluent maps both onto the presence of actively foraging shore crabs, and, simultaneously, onto the response of moving towards varied sand depth: "predators around/move deeper" is the simultaneously descriptive/directive content of a biological organism that is too primitive to engage in inferential representational processing—hence, we are also here encountering a case of PPR, as well as a fine fit for a unitary, non-conjunctive valent representation.

Let me finally refer to a case that may corroborate Cochrane's detailed and imaginative discussion of bacteria, though not those blessed with magnetosomes, but with a cylindrical spiked-tipped inner tube, inserted directly into the cytoplasm of a target cell; when the spike breaks off it delivers toxins into the target cell (Le Roux et al. 2015). The bacterium can detect cell envelope damage incurred by an attack, and it retaliates with its own attack directed in the direction of the detected assault. In the context of such a mutual attack, the retaliating cell is destroyed but its destruction results in lysis, thereby spreading its danger signal into its surroundings, which results in an increased defensive response by the rest of the bacterial community. The signal seems to play both a

descriptive and a directive role, simultaneously indicating cell envelope damage and initiating a targeted response (Bauer 2020): another obvious case of a primitive system's exemplification of a unitary, non-mediated, non-inferential case of a representation that both tracks a vital change in the environment and triggers a fitting response.

Plants, clams, and bacteria seem to furnish us with empirical evidence in support of the presence of pushmi-pullyu representations and, if I understand them correctly, valent representations. However, our topic is not the on-its-own admirable domain of primitive biological systems, but of emotional phenomena of humans and other animals. How does the PPR hypothesis fare as soon as we move beyond the most elementary of living organisms? The answer, if my reading of the relevant literature is correct, is not very well. Indeed, except for a very limited subsection of animal signals, PPRs are simply not doing any of the explanatory work suggested by Millikan, or by philosophers inspired by her original hypothesis. In fact, the standard examples supplied by supporters of the PPR hypothesis, i.e., the bee's waggle dance, some bird songs, and vervet monkeys' predator calls, are anything but unitary, non-conjunctive, double-facing instances of a unitary representation. That is not surprising, given Millikan's insistence of approaching the nature of content via cases of signaling; that approach might make sense given the specific agenda of Millikan's own version of teleosemantics. It might limit, though, the prospects of our research into the nature of mental content (a point also brought up by Cochrane's discussion).

In any case, it appears that the case for PPRs in anything but the most primitive of organisms is hard to sustain: related research on avians, fish, reptiles, and mammals reveal a complexity in how descriptive and directive content are intertwined, enabling paper wasps (Tibbets 2008), rattlesnakes (Owings 2002), canyon wrens (Benedict et al. 2012), lake-side lazy frogs (Schulte 2012) and, of course, prairie dogs (Slobodchikoff 2002), to regularly and spontaneously engage in veracity testing, satisfaction testing, and directive denial with descriptive retention (Bauer 2020), none of which would be even conceivable if descriptive and directive content were not primarily given as clearly distinct.

That an appeal to PPRs does not constitute a credible hypothesis as soon as we move into the complex world of animal life is not surprising, given that members of most animal species are organisms with multimodal perceptual systems capable of registering information that needs to be processed across a variety of dimensions, assessing for consistency, accuracy, and some minimal degree of integration crucial to survival (Rowe 1999; Stein and Meredith 1993). It is, thus, perhaps no accident that the standard way of introducing cases of PPRs as supposedly applying to human beings works in a single modality, and indeed, with regard to a single quality (cf. Cochrane's lucid example, with which he opens his discussion of valent representations of a creature's registering the presence of/withdrawing from a source of heat; Cochrane 2018, 14-15).

In her seminal paper on the idea of a non-conjunctive, double-facing representation, Millikan is not shy of declaring the wide applicability of her hypothesis: human thought and language in its various forms, intentions, norms, commands, performatives, even thick ethical concepts, all count as plausible cases of pushmi-pullyu representations. Cochrane is not only more cautious in setting limits in the application of valent representation, but he is also meticulous in spelling out the mechanisms through which mental content is enriched as we move from valent representation to various forms of affectivity, of bodily feelings, and of emotions.

I wonder, though, what might have been the impetus for building up such a refreshingly ambitious philosophical project on the basis of an idea about a type of representation, which—if my take on the relevant scientific literature is not too amiss—is not that significant a presence in the animal kingdom, not to speak about the world of beings endowed with the capacity of conceptual thought, volition, and multimodal imagination.

One answer might be that, contrary to what I have so far assumed, Cochrane's notion of valent representation—despite his own way of introducing the discussion of that notion, and his statement that he “draws inspiration from Millikan's model of pushmi-pullyu representations” (49)—is not, after all, related to pushmi-pullyu representations; and, thus, any problems that, in my view, pertain to the latter, may hopefully leave the former totally unaffected.

Let me conclude by stressing the significance of Cochrane's introduction of a valent representation for the current debate over the nature of emotion. Most analytic philosophers nowadays tend to argue for the identification of emotion with some *other* item of our mental life, be it judgment, perception, construal, feeling, or a combination thereof. Through the hypothesis of valent representation, *The Emotional Mind* ventures to identify emotion with something that, if it exists, is both functionally substantial and irreducible to other types of mental phenomena, thus securing an important place for emotion as a truly distinct and fundamental feature of human life.

References

- Artiga, Marc. 2014. "Teleosemantics and Pushmi-Pullyu Representations." *Erkenntnis* 79 (3): 545–66. <https://doi.org/10.1007/s10670-013-9517-5>.
- Bauer, Mark. 2020. "The Explanatory Breadth of Pushmi-Pullyu Representations." *Biology and Philosophy* 35 (3). <https://doi.org/10.1007/s10539-020-09751-5>.
- Benedict, Lauryn, Anne Rose, and Nathaniel Warning. 2012. "Canyon Wrens Alter Their Songs in Response to Territorial Challenges." *Animal Behaviour* 84 (6): 1463–67. <https://doi.org/10.1016/j.anbehav.2012.09.017>.
- Cochrane, Tom. 2018. *The Emotional Mind*. Cambridge, UK: Cambridge University Press.
- Griffiths, C. L., and C. A. Richardson. 2006. "Chemically Induced Predator Avoidance in the Burrowing Bivalve *Macoma Balthica*." *Journal of Experimental Marine Biology and Ecology* 331 (1): 91–98. <https://doi.org/10.1016/j.jembe.2005.10.002>.
- Heil, Martin, and Juan Carlos Silva Bueno. 2007. "Within-Plant Signaling by Volatiles Leads to Induction and Priming of an Indirect Plant Defense in Nature." *Proceedings of the National Academy of Sciences - PNAS* 104 (13): 5467–72. <https://doi.org/10.1073/pnas.0610266104>.
- LeRoux, Michele, S. Brook Peterson, and Joseph D. Mougous. 2015. "Bacterial Danger Sensing." *Journal of Molecular Biology* 427 (23): 3744–53. <https://doi.org/10.1016/j.jmb.2015.09.018>.
- Millikan, Ruth Garrett. 1995. "Pushmi-Pullyu Representations." *Philosophical Perspectives* 9: 185–200. <https://doi.org/10.2307/2214217>.
- Owings, D. H. 2002. "The Cognitive Defender: How Ground Squirrels Assess Their Predators." In *The Cognitive Animal*, edited by M. Bekoff, C. Allen, G. Burghardt, 19–26. Cambridge, MA: MIT Press.
- Rowe, Candy. 1999. "Receiver Psychology and the Evolution of Multicomponent Signals." *Animal Behaviour* 58 (5): 921–31. <https://doi.org/10.1006/anbe.1999.1242>.
- Schulte, Peter. 2012. "How Frogs See the World: Putting Millikan's Teleosemantics to the Test." *Philosophia (Ramat Gan)* 40 (3): 483–96. <https://doi.org/10.1007/s11406-011-9358-x>.
- Slobodchikoff C. 2002. "Cognition and Communication in Prairie Dogs." In *The Cognitive Animal*, edited by M. Bekoff, C. Allen, and G. Burghardt, 257–64. Cambridge, MA: MIT Press.
- Stein, Barry E. and M. Alex Meredith. 1993. *The Merging of the Senses*. Cambridge, MA: MIT Press.
- Tibbetts, Elizabeth A. 2008. "Resource Value and the Context Dependence of Receiver Behaviour." *Proceedings of the Royal Society. B, Biological Sciences* 275 (1648): 2201-06.